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**PROPOSED
REMEDIAL INVESTIGATION
STRATEGY**

Hi-Mill Manufacturing Co.

RECEIVED

AUG 09 1988

**EMERGENCY &
REMEDIAL
RESPONSE BRANCH**

August 8, 1988

**PROPOSED REMEDIAL INVESTIGATION STRATEGY
FOR HI-MILL MANUFACTURING COMPANY**

1.0 INTRODUCTION

Hi-Mill Manufacturing Company has fabricated copper, aluminum and brass tubular parts at its 2.5 acre site located at 1074 Highland Road (Michigan State Highway 59), Highland Township, Michigan since 1946. Process wastewater from metal finishing activities was discharged to an unlined lagoon south of the production building until 1983. At that time the company, fully cooperating with guidance issued by the Michigan Department of Natural resources (MDNR), removed all sludge and contaminated soil from the lagoon and had it properly disposed. Wastewater discharges to the lagoon were terminated, and all wastes have since been transported and disposed according to applicable waste management laws and regulations.

Three environmental investigations have been performed by the MDNR at the site and in wetland areas adjacent to the site. The following are summaries of the studies and their results:

April 1978 - Samples were collected from the wastewater lagoon, site process well, and the adjoining wetland. Chemical analysis results indicated no evidence of contamination in the process water well, but elevated levels of toxic metals were found in lagoon and lagoon overflow samples. Elevated levels of toxic metals were also measured in sediments from the adjacent (east) wetland.

August 1982 - A hydrogeological study was performed in the perched water layer east and south of the Hi-Mill facility. Monitoring wells were installed to depths of approximately 4 - 6 feet below existing ground surface. Elevated levels of aluminum, chromium, copper and zinc were measured in the perched water east and southeast of the former lagoon. The perched water layer was found to be flowing in the general direction of the adjacent wetland.

April 1985 - A biological and water chemistry study was performed on the wetland lying east of the Hi-Mill facility. Surface water, sediments and organisms were sampled and analyzed. No connection was identified between the wetland and the nearby Waterbury Lake. Surface waters in the wetland had generally higher levels of some toxic metals than the waters from Waterbury Lake, but only copper was measured at levels above chronic criteria for freshwater aquatic life. Elevated levels of toxic metals were again measured in sediment samples from the wetland. Results from organism studies were inconclusive.

The Hi-Mill Manufacturing site has now been referred to the Usepa for remedial action under CERCLA. Techna Corporation has been retained to design and conduct a remedial investigation (RI) of the property. The proposed scope of work for this RI is summarized in the following sections of this document. This summary is intended as an outline to serve only as a basis for discussions with the USEPA concerning the technical approaches for the RI. Once a mutually agreeable technical approach strategy has been developed, a detailed workplan, health and safety plan and quality assurance plan will be developed.

2.0 SITE DESCRIPTION

Hi-Mill Manufacturing Company is located at 1704 Highland Road (Michigan State Highway 59), Highland Township, Michigan. The facility comprises an area of approximately 2.5 acres and is surrounded by the State of Michigan's Highland Recreational Area. The company has been producing fabricated aluminum, copper and brass tubular products at the site since 1946.

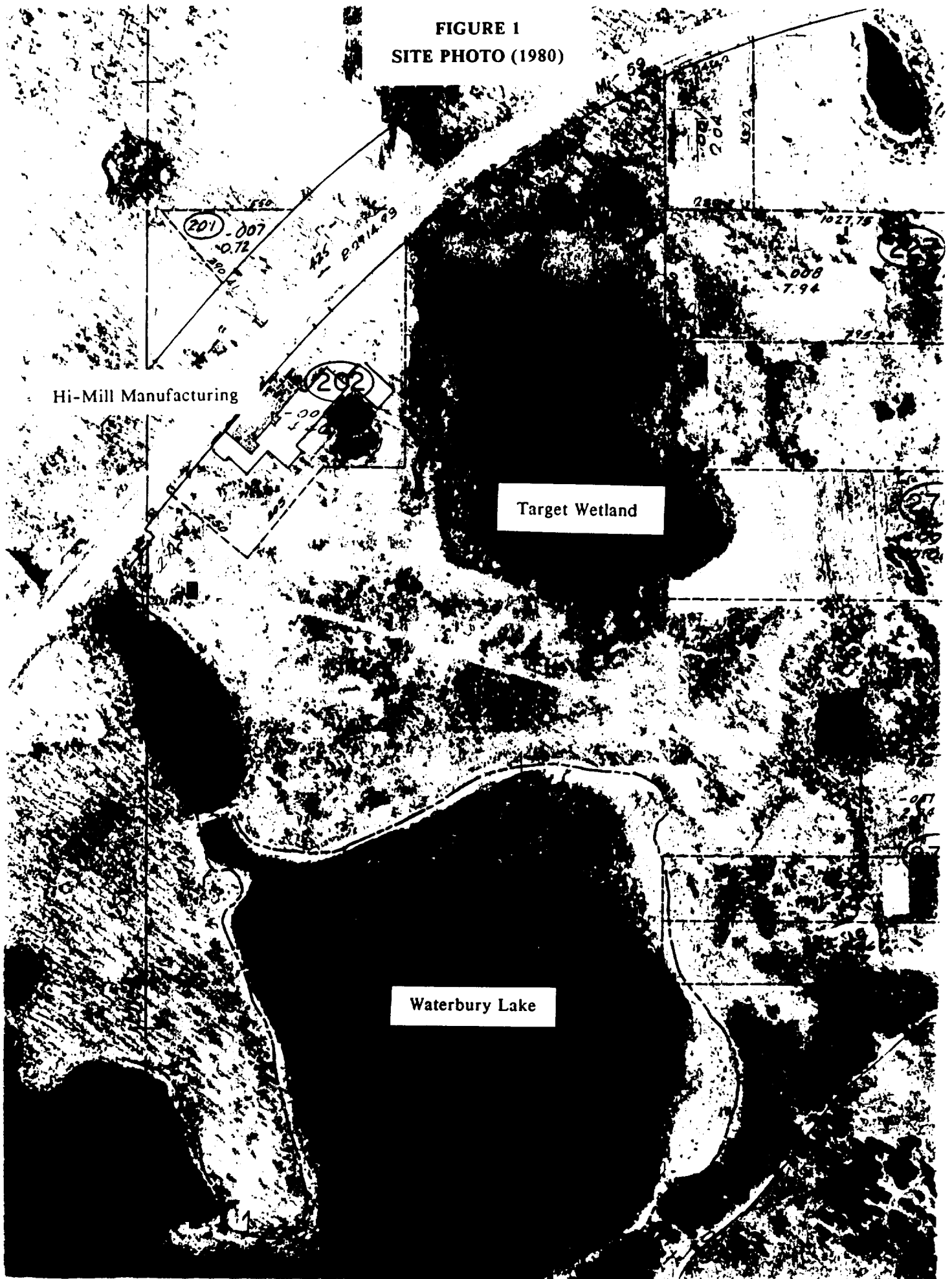
A 1980 aerial photograph of the site is shown in Figure 1. A wetland area lies immediately east of the site, and Waterbury Lake lies to the south. Data from USGS topographical maps and an MDNR hydrogeological report indicate that surface run-off and perched water from the site both flow toward the eastern wetland. The April 1985 MDNR report confirmed that there is no connection between the wetland and Waterbury Lake.

3.0 REMEDIAL INVESTIGATION TECHNICAL APPROACH

The remedial investigation is designed to answer the following three questions concerning the potential environmental impact of past site activities:

- * Are there any continuing sources of contamination remaining on the Hi-Mill property (soil and perched water sampling and analysis)?
- * Have deeper, usable aquifers been contaminated (hydrogeological study)?
- * What are the current levels of contamination in wetland waters and sediments; is the surface water serving to recharge deeper aquifers (sediment and water sampling and analysis, hydrogeological study)?
- * Is remedial action warranted, and if so, what methods should be employed?

FIGURE 1
SITE PHOTO (1980)



Brief descriptions of proposed technical approaches for soils sampling and analysis, wetlands sampling and analysis, and a groundwater investigation are presented in the following subsections.

3.1 Soils Sampling and Analysis

Soil samples will be collected in the gridded area and background locations indicated in Figure 2. The grid pattern was established on 60' centers and covers the areas of exposed soils on, and immediately adjoining, the Hi-Mill property. This grid spacing complies with MDNR guidelines ("How Clean is Clean", 1987) and provides an 80% confidence level for finding all "hot spots" with diameter greater than 30' (Statistical Methods for Environmental Pollution Monitoring, R.O. Gilbert, 1987). This interval is appropriate for the types and areal sizes of expected contaminated areas.

Samples will be collected with split spoon samplers at depths of 0 - 1', 1 - 2' and two-foot centers thereafter until the first confining layer is penetrated at least two feet. Samples from the first two depths will be initially analyzed for the presence and concentration of Priority Pollutant metals and cyanide. If elevated levels of metals are measured in samples from any sampling location, additional samples from subsequent depths will be analyzed to determine depth of migration.

Four samples from the 0 - 1' depth will also be analyzed for the Priority Pollutant Organic volatile and extractable organic species. These samples will be collected from the vicinity of the two lagoons and from two areas east and southeast of the eastern fence line.

Two sets of background samples will be collected from soil horizons identified in the grid sampling. These are located northeast and north of the Hi-Mill facility as shown in Figure 2. The northeast samples will be collected to determine background effects of highway run-off on the soil chemistry. The northern samples will be collected as representative of "true" background. Samples from each soil horizon will be analyzed for the Priority Pollutant metals.

3.2 Wetlands Sampling and Analysis

Water and sediment samples will be collected in the wetland and Waterbury Lake at the locations indicated by an "X" in Figure 3. The locations were selected so as to supplement data previously collected by the MDNR and to provide additional data for other areas of the wetland and lake.

FIGURE 2
SOILS SAMPLING DIAGRAM

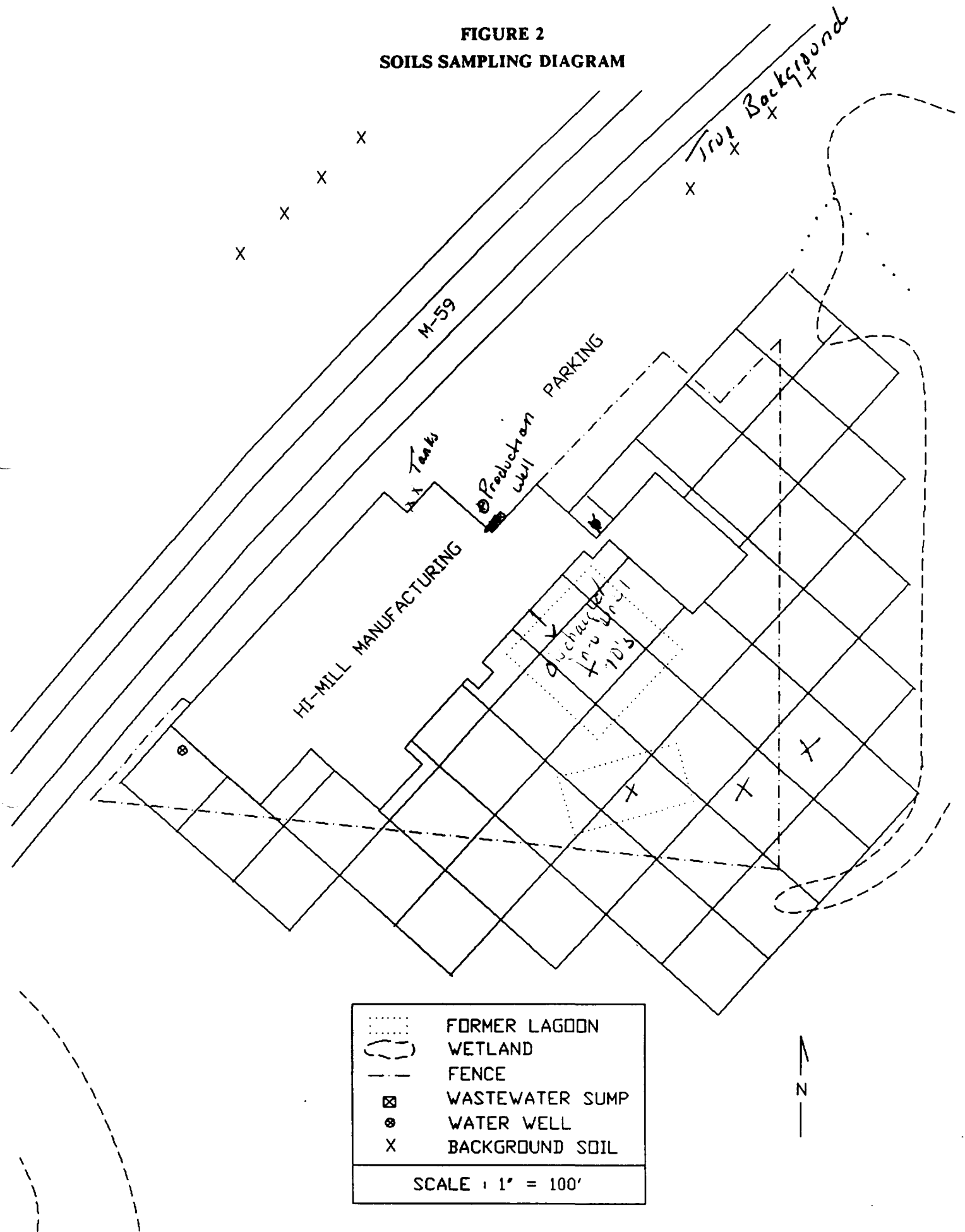
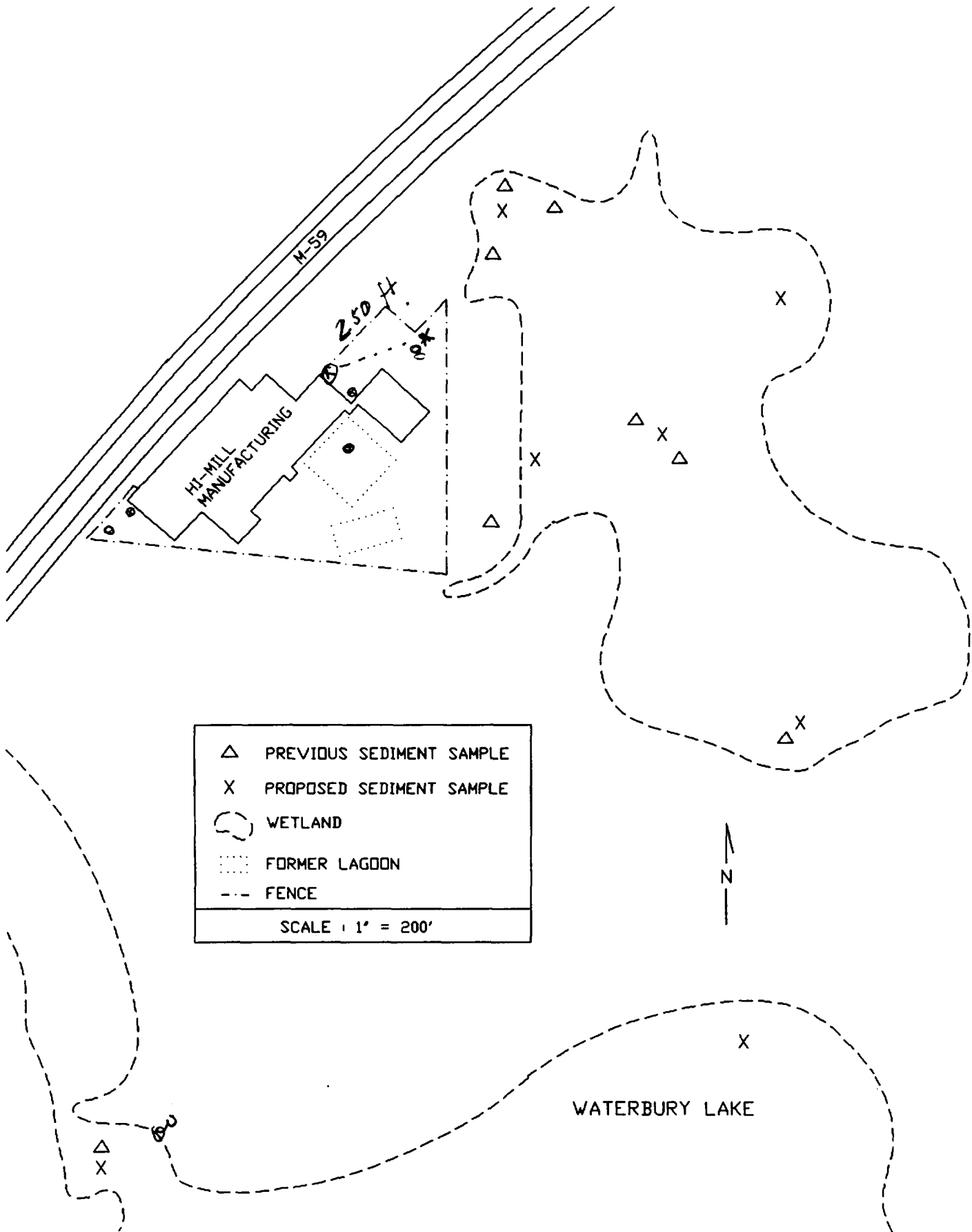


FIGURE 3
WETLANDS SAMPLING DIAGRAM



Four water and sediment samples will also be collected from the wetland indicated in Figure 4. This area has the same classification as the wetland under study and also lies near M-59. Therefore, it is an appropriate background reference location.

3.3 Hydrogeological Study

The proposed hydrogeological study will be conducted in two parts. The first will encompass an expanded investigation of the potential contamination of perched water in the area of the Hi-Mill facility, and the second will investigate potential interactions with deeper, usable aquifers.

The perched water investigation will involve the sampling of the saturated zone through screened auger borings placed at locations B1 through B12 in Figure 5. These samples, combined with additional water samples collected from the existing monitoring wells (MDNR, 1982), provide complete coverage of the areas considered possible continuing sources (lagoon areas, production building, and wastewater sumps) and the areas necessary to determine plume configuration and flow direction.

Water samples will be analyzed for the Priority Pollutant metals and cyanide. Samples collected from B10 - B12 will also be analyzed for the Priority Pollutant volatile and extractable organic species.

Five sets of nested wells (two wells each) will be installed in the locations marked W1 through W5 in Figure 5. One well will be screened in the perched water stratum, and the second will be screened in the aquifer located at 45 - 60' below ground level. A review of local well logs indicates that most drinking water wells are set in this or deeper aquifers.

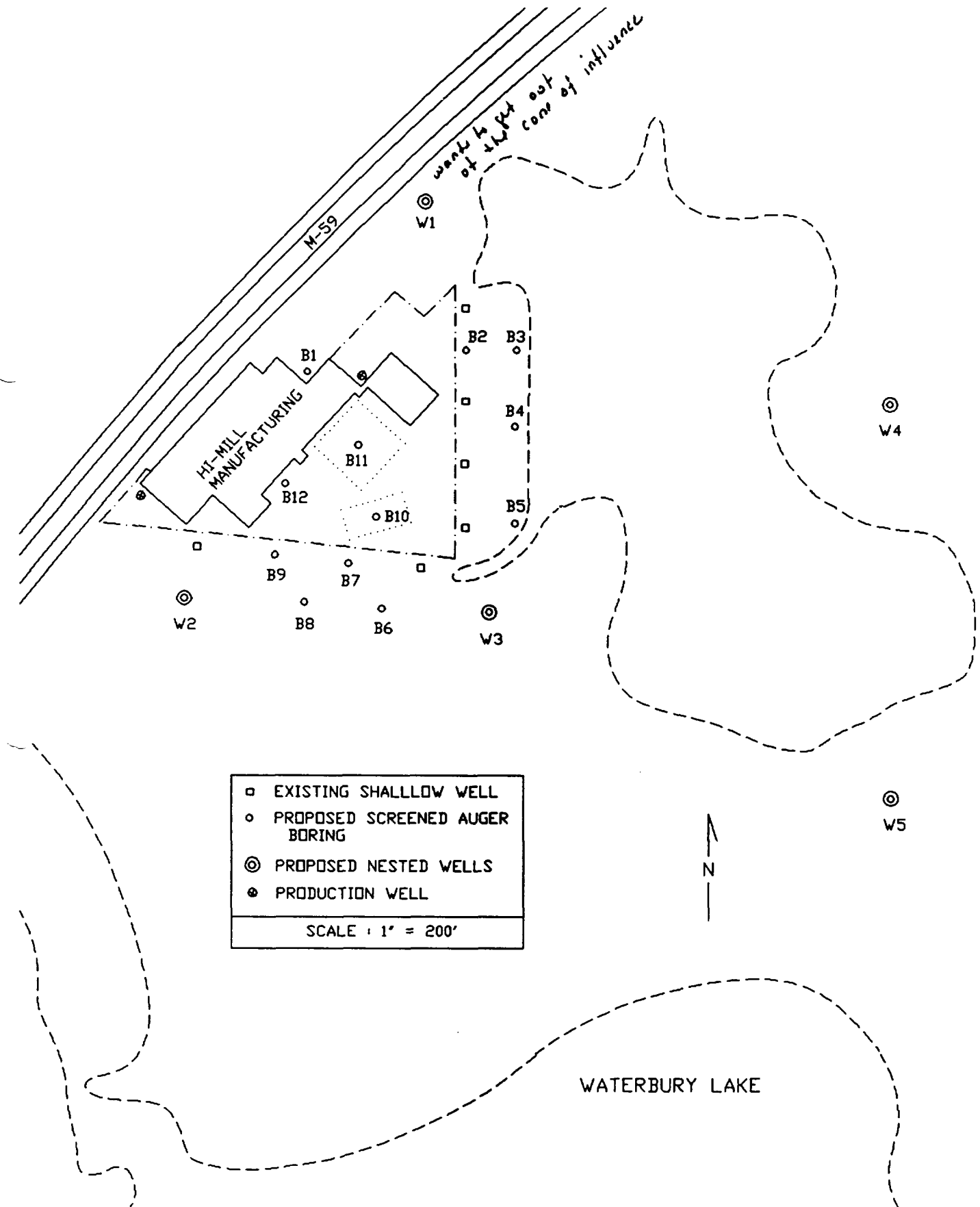
The locations of well units W1 and W2 were selected to avoid the influence of the two existing production wells located southwest and northeast of the production building. Wells W3 will be located downgradient of the former wastewater lagoons. Groundwater elevation data from these nested wells will be used to evaluate the potential for hydraulic connectivity between the perched water stratum and the wetland surface water with the deeper aquifer.

Water samples will also be collected from wells W1 - W5 and the two production wells to evaluate the chemistry in the deeper aquifers. These samples will be analyzed for the Priority Pollutant metals.

BACKGROUND WETLAND LOCATION DIAGRAM



FIGURE 5
HYDROGEOLOGICAL STUDY DIAGRAM



4.0 CONCLUSION

Upon mutual agreement on a proposed technical approach to the remedial investigation of the Hi-Mill Manufacturing Company site, a detailed workplan for the assessment will be prepared. A site safety plan and quality assurance plan will also be prepared. All plans will be submitted to the USEPA Region V for review and approval prior to commencement of any site activities.